DETERMINATION OF THE SPECIFIC HEAT AND TOTAL HEMISPHERICAL TOTAL EMISSIVITY OF THE HIGHLY UNDERCOOLED $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10.0}Be_{22.5}$ ALLOY

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High temperature high vacuum electrostatic levitation was combined with DSC experiments to determine the specific heat C_p of the undercooled $Zr_{41.2}Ti_{13.8}Cu_{12.5}Ni_{10.0}Be_{22.5}$ liquid as a function of temperature. The containerless approach made it possible to undercool the melt to the glass transition temperature without inducing nucleation. Because the cooling process was purely radiative, non-contact temperature measurement techniques could be used to determine the specific heat to total hemispherical emissivity ratio, C_p/ε_T, for the undercooled liquid region. Using C_p values which were independently obtained by DSC, ε_T could be determined. With knowledge of C_p of the undercooled liquid it was possible to determine other thermodynamic properties such as Gibbs free energy and entropy as a function of undercooling.